

Color: Use yellow for E; pink or tan for K; and a similar but darker color for J; and light colors for A, D, and G. (1) Color the two illustrations of the breast and underlying breast structures together. (2) Color the arrows indicating the direction of lymph flow and the lymph nodes of the breast. Note network of lymph vessels. (3) Color the diagrams of breast development. (4) Color the enlarged view of glands and ducts in the lower right corner.

BREAST
SUPERFICIAL FASCIA (AT)
SUSPENSORY LIGAMENT
ALVEOLAR LOBE
LACTIFEROUS DUCT
LACTIFEROUS SINUS

The **breast** (in both males and females) is in the **superficial** (subcutaneous) **fascia** overlying the **pectoralis major muscle** on the anterior chest wall. It is an area of fatty (adipose and loose areolar) fibrous tissue, with associated nerves and blood and lymphatic vessels. The fatty tissue is supported by extensions of the **deep fascia** overlying the muscle (**suspensory ligaments**) and functions most prominently in the young, well-developed, postpubescent female breast. Packed within the adipose tissue is a collection of branching ducts (**lactiferous ducts**). In the male and in the nonpregnant (nonlactating) female, these ducts are undeveloped. Few or no glands (alveoli) are associated with the ducts in those populations. At puberty, the increased secretion of estrogen from the ovaries (and perhaps the adrenal glands) in the female influences an enlargement of the nipple and areola and a generally marked increase in local fat proliferation. As a result, the breast enlarges to some degree, though it is highly variable.

In the early stages of pregnancy, the **lactiferous duct** system undergoes profound proliferation, and small, inactive **tubular** and **alveolar (tubuloalveolar) glands** form, opening into alveolar ducts. A **lobule** consists of a number of these ducts and glands. A **lobe** (of which there are 15–20) consists of a number of lobules and an interconnecting **interlobular duct**. The interlobular ducts converge to form as many as 20 **lactiferous ducts**. These ducts dilate to form **lactiferous sinuses** just short of the nipple, and then narrow again within the nipple. These sinuses probably function as milk reservoirs during lactation. The **nipple** consists of pigmented skin with some smooth muscle fibers set in fibrous tissue. Erection of the nipple may enhance flow of milk through the ducts. The circular **areola**, also pigmented more highly than the surrounding skin, contains sebaceous glands that may act as a skin lubricant during periods of nursing. In the latter stages of pregnancy, the alveolar glands undergo maturation and begin to form milk. Milk production peaks after delivery of the newborn, as the result of the action of several hormones influencing the gland cells. The movement of milk toward the ducts (called **letdown**) and excretion of the milk to the nipple is the result of a neuroendocrine reflex mechanism initiated by the baby's sucking on the nipple.

The lymphatic vessels are an important part of the breast; they drain the fat portion of the milk produced during lactation. They also transfer infected material or neoplastic (cancer) cells from the breast to more distant parts. The potential lymphatic avenues for metastasis or spread of infection are shown at left.

